



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-0882N
Plant ID No.: 039-00663
Applicant: Optima Belle LLC
Facility Name: Belle
Location: Belle, Kanawha County
NAICS Code: 325199
Application Type: Class II Administrative Update
Received Date: December 29, 2016
Engineer Assigned: Mike Egnor
Fee Amount: \$300.00
Date Received: December 22, 2016
Complete Date: February 2, 2017
Due Date: April 3, 2017
Applicant Ad Date: January 3, 2017
Newspaper: *The Charleston Gazette*
UTM's: Easting: 451.90 km Northing: 4,232.60 km Zone: 17
Description: An alternative operating scenario for the production of Negolyte which is a proprietary process used for energy storage applications. It is an aqueous solution used as an electrolyte solution in flow batteries for stationary energy storage. Emissions from this scenario include 0.34 lbs/hr and 0.02 TPY of VOC's, 0.01 lbs/hr and 0.01 TPY of Catechol, 0.33 lbs/hr and 0.01 TPY of Toluene, 0.03 lbs/hr and 0.01 TPY of Hydrogen Chloride, 0.01 lbs/hr and 0.01 TPY of Titanium Tetrachloride, 0.12 lbs/hr and 0.03 TPY of Particulate Matter, and 0.38 lbs/hr and 0.04 TPY of Total HAP's.

INTRODUCTION

On December 22, 2016 Optima Belle LLC submitted a Class II Administrative Update for the proposed revisions to an operating scenario for the production of Negolyte at the Belle Plant.

On January 9, 2017, Optima submitted an affidavit of publication indicating that the required legal notice was run in the Charleston Gazette on January 3, 2017, initiating the 30-day public notice period. Optima also submitted the application fee of \$300 on December 22, 2016 to meet the requirements associated with the Application for Modification Permit.

DESCRIPTION OF PROCESS

Negolyte Process Overview:

Negolyte is a proprietary process used for energy storage applications. It is an aqueous solution used as an electrolyte solution in flow batteries for stationary energy storage.

SITE INSPECTION

No site inspection was performed by the permitting engineer for this modification as the facility is well known to the DAQ and is frequently inspected by members of the DAQ Enforcement Section.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Negolyte Process

Emission Point 104.014, which is the exit of the main scrubber (003), incinerator (009), and incinerator scrubber (010) is stated as 93% efficient for VOCs, 99.98% efficient for Toluene and Hydrogen Chloride, and 97% efficient for Titanium Tetrachloride. The facility is not claiming any reduction in emissions for Catechol. Emissions from this scenario include 0.34 lbs/hr and 0.02 TPY of VOC's, 0.01 lbs/hr and 0.01 TPY of Catechol, 0.33 lbs/hr and 0.01 TPY of Toluene, 0.03 lbs/hr and 0.01 TPY of Hydrogen Chloride, 0.01 lbs/hr and 0.01 TPY of Titanium Tetrachloride, 0.12 lbs/hr and 0.03 TPY of Particulate Matter (104.003B), and 0.38 lbs/hr and 0.04 TPY of Total HAP's.

Emissions Summary

The proposed changes addressed in permit application R13-0882N shall result in the affected emission points undergoing emissions as shown in the following Table 1 - Emissions Summary.

Table 1 - Emissions Summary Operating Scenario: Negolyte Process

| Emission Point ID | Device Type | Pollutant | Air Pollution Control Device ID | Maximum Potential Uncontrolled Emissions | | Maximum Potential Controlled Emissions | |
|-------------------|--|------------------------|---------------------------------|--|---------|--|--------|
| | | | | lbs/hr | tons/yr | lbs/hr | lbs/yr |
| 104.003B | Dust Collector | PM | 115 | 0.48 | 0.03 | 0.12 | 60 |
| 104.014 | Main Scrubber/ Incinerator/ Incinerator Scrubber | VOC's | 003 | 4.99 | 0.30 | 0.34 | 40 |
| | | Catechol | 009 | 0.01 | 0.01 | 0.01 | 20 |
| | | Toluene | 010 | 4.98 | 0.29 | 0.33 | 20 |
| | | Hydrogen Chloride | | 238.47 | 19.32 | 0.03 | 20 |
| | | Titanium Tetrachloride | | 0.36 | 0.01 | 0.01 | 20 |
| | | Total HAPs | | 243.82 | 19.63 | 0.38 | 80 |

REGULATORY APPLICABILITY

The following State and Federal regulations were considered for applicability to the subject facility:

The following regulations apply to this production unit: West Virginia Regulations 6, 13, 21, 30 and US EPA MACT Standards for the Miscellaneous Organic NESHAP.

RULE 7 - CONTROL OF PARTICULATE MATTER FROM MANUFACTURING PROCESSES

Particulate matter from the Negolyte Process is sent through the dust collector 115 (104.003B). The dust collector is subject to Rule 7. This is a "Type a" Source Operation under Rule 7. There are no claimed reductions in particulate matter from Dust Collector 023. The PM emissions are 0.12 lbs/hr, which are below the Rule 7 limit. The opacity requirements for these sources are already permitted under their Title V Permit.

RACT

45CSR21-40.3.c requires RACT analysis on a case by case basis for those VOC emissions greater than 6 pph which are constructed, modified, or begin operation after the date 45CSR 21 becomes effective. The proposed changes to R13-0882N do not include an increase of VOC's greater than 6 pph.

This class II permit amendment application is being filed under 45CSR13 since a change in batch production is being requested. Overall, 0.02 TPY of VOC's, 0.01 TPY of Catechol, 0.01 TPY of Toluene, 0.01 TPY of Hydrogen Chloride, 0.01 TPY of Titanium Tetrachloride, 0.03 TPY of Particulate Matter, and 0.04 TPY of Total HAP's will be emitted.

TOXICITY OF CRITERIA REGULATED POLLUTANTS

Pyrocatechol has the following exposure limits:

ACGIH TLV

5 ppm TWA

NIOSH REL

5 ppm TWA

20 mg/m³ TWA

OSHA PEL

20 ppm STEL

5 mg/m³ TWA

Ethylenediaminetetraacetic acid has the following exposure limits:

Acute oral toxicity (LD50): 30 mg/kg [Mouse]

Mortality NOEC - *Lepomis macrochirus* - 24mg/l - 96 hr

LC50 - *Lepomis macrochirus* [Bluegill] 34-62 mg/l - 96 hr

EC50 - *Daphnia magna* [Water flea] 113 mg/l - 48 hr

Potassium chloride has the following exposure limits:

Acute oral toxicity (LD50) 1,500 mg/kg [Mouse]

Pyrogallol has the following exposure limits:

Oral [Human] 28 mg/kg (LDLO)

Subcutaneous [Man] 120 mg/kg (LDLO)

Oral [Mouse] 300 mg/kg (LD50)

Intraperitoneal [Mouse] 400 mg/kg (LD50)

Subcutaneous [Mouse] 566 mg/kg (LD50)

Oral [Rabbit] 1,600 mg/kg (LD50)

Oral [Bird] 75 mg/kg (LD50)

Titanium Tetrachloride has the following exposure limits:

Inhalation [Rat] 0.46 mg/l - 4 hrs (LC50)

Oral [Rat] 464 mg/kg (LD100)

Toluene has the following exposure limits:

ACGIH TWA

20 ppm

NIOSH REL

375 mg/m³ TWA

100 ppm TWA

560 mg/m³ ST

150 ppm ST

OSHA

200 ppm TWA

300 ppm CEIL

500 ppm Peak

100 ppm TWA

375 mg/m³ TWA

150 ppm STEL

560 mg/m³ STEL

MONITORING OF OPERATIONS

The Title V Permit provides monitoring requirements due to opacity readings. The facility is already required to monitor visible emissions (Condition 4.2.2), monitor their production (Condition 4.2.1), and to monitor the temperature of the incinerator (Condition 4.2.3).

Changes to R13-0882N include:

1. Updated the Permit Number to R13-0882N.
2. Added Condition 4.1.2.13.1 to require that the main scrubber (003), incinerator (009), and incinerator scrubber (010) be used at emission point 104.014 during all periods of the Negolyte process. Also added that the dust collector 115 shall be employed by emission point 104.003B to minimize particulate emissions generated during periods in which solids are charged to the reactor.. A limit for the total number of batches per year has also been added.
3. Added Condition 4.1.2.13.2 to require specific emissions limits for Particulate Matter, VOC's, Catechol, Toluene, Hydrogen Chloride, Titanium Tetrachloride, and Total HAP's for the Negolyte process.

4. Added "R13-0882N" to Condition 2.5.1.
5. Updated the page numbers in the Table of Contents.
6. Added Condition 4.1.10 for a 45CSR6 particulate matter limit.
7. Switched the Northing and Easting citations to the correct numbers on Page 2.
8. The dust collector (115) was listed twice in the emission units table on Page 4. One has been removed.
9. Emission Point 104.014 was mislabeled as 114.014 in Conditions 4.1.2.1.2, 4.1.2.2.2, 4.1.2.4.2, 4.1.2.6.4, 4.1.2.6.7, 4.1.2.6.9, 4.1.2.8.2, 4.1.2.9.2, 4.1.2.10.2, and 4.1.2.12.2. This has been corrected.
10. Corrected Condition 4.1.2.2.1 Emission point 104.003 to 104.003B.
11. Corrected Condition 4.1.2.7.1 Emission point 115A to 115.
12. Corrected Table 4.1.2.9.4 the control device id from 115A to 115.
13. Corrected Condition 4.1.2.12.1 the dust collector id from 210 to 023.

RECOMMENDATION TO DIRECTOR

Permit application, R13-0882N, submitted by Optima Belle, LLC, for the administrative permit update of the production facility located at the Belle Plant in Belle, Kanawha County, WV, has been reviewed and determined to meet all applicable requirements, and is therefore, recommended for approval.



Mike Egnor
Engineer



Date

Fact Sheet R13-0882N
Optima Belle, LLC
Belle Plant